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Risk Factors of Diarrhoea in Malnourished Children under Age of 5 Years

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Abstract:

Background: Acute infectious enteritis remains one of the commonest causes of death among infants and children in developing countries. Acute enteritis is defined as a loss of stool consistency with pasty or liquid stools, and/or an increase in stool frequency to more than three stools in 24 hours with or without fever or vomiting. Human survival depends on the secretion and reabsorption of fluid and electrolytes in the intestinal tract. The objective of the study is to evaluate the risk factors of diarrhoea in children under age of 5 years.

Methodology: It was an observational study. Study was completed in about six months**.** Non-probability purposive sampling technique was used. In this study, 270 samples were taken from Diarrhoeal ward of Gulab Devi Hospital Lahore, Pakistan.

Results: In this study, out of 270 patients, 58.52% were males and 41.48% were females. 90.37% patients were vaccinated. 54.81% had weaning history. 91.85% patients had feeding history. 29.26% had blood in stool. 96.67% patients were dehydrated. 95.56% patients had loose watery diarrhoea. 62.96% patients used boiled water. 58.52% patients consumed less than half litre of water, 30.00% patients consumed 1 litre of water and 11.48% patients consumed > 1 litre of water. 49.18% patients had proper hygiene. 38.15% mothers of patients were well educated. 40.37% patients had model household condition. 57.41% patients lived in rural area and 42.59% patients lived in urban area.

Conclusion: The variation in the level of diarrhoeal morbidity was well explained by maternal education, income, personal hygiene, refuse disposal system and the effect of health extension programme.

Keywords: Diarrhoea, Hygiene, Household condition, Malabsorption, Dehydration

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Introduction:

Acute infectious enteritis (including gastroenteritis) remains one of the commonest causes of death among infants and children in developing countries (1). The younger the child, the greater the risk that fluid and electrolyte losses will lead to dehydration (2). Fluid losses resulting from diarrhoea and vomiting can be as high as three times the circulating blood volume (80–125–250 mL per kg body weight per day). Diarrhoea kills an estimated 2.5 million

people each year, with about 60-70% of them being children under five years of age (3). The disease is responsible for over a quarter of the deaths of children in the world today (4). Most of these deaths occur in developing countries where an estimated 25% of under-five mortality is directly attributed to diarrhoeal disease (5). Every sixth child under age 5 in Germany is taken to see a physician at least once per year because of acute gastroenteritis (6).

Basic hygiene, household sanitation and adequate appropriate feeds are emphasized in different health clinics and well child visits (7). Although these efforts have been shown to decrease the severity of acute diarrheal episodes and sharply reduce the number of subsequent death (7), a large number of children are still afflicted with diarrhoea that has a negative impact on their growth and development (8).

Exclusive breastfeeding in infancy is known to protect against diarrhoea with maternally acquired antibodies helping to fight infective agents responsible for the disease. However, at this stage, there is a general decline in these antibodies and more so in those not exclusively breastfed, and hence the high risk of developing diarrhoea (8). Besides, complementary feeds are usually introduced at this stage with an attendant increase risk of contamination, especially in the developing world like ours where safe water and basic sanitation is lacking (8). This study aims to evaluate the risk factors of diarrhoea in malnourished children under age of 5 years.

Material and Methods:

This cross-sectional study was conducted at diarrhoeal ward of The Children Hospital and Institute of Child Health Lahore, Pakistan based on non-probability sampling technique. 270 children were included in the study. Sample size was calculated statistically. Both male & female patients age below 5 years reported with diarrhoea were included. An informed consent was taken from all the patients' parents. History of height and weight of all the participating subjects was also taken.

The data was analysed by using SPSS version 16. The qualitative data were presented in the form of graphs and tables along with its percentage. The quantitative data were presented in the form of mean, range and standard deviation by the simple descriptive statistics. The bar charts, pie charts and the cross tabulation was also given for the qualitative data.

Results:

The mean age of studied patients were 1.46$\pm$1.28 years. Mean weight of studied patients was 10.34$\pm$5.66 kg. Mean height of was 29.53$\pm$6.19 cm. Out of 270 children, 158 (58.52%) were male and 112 (41.48%) were female. Children suffering from diarrhoea who were already vaccinated were 244 (90.37%). Frequency of boiled water drinkers was 62.96%. Frequency of proper hygiene was 49.18%. Feeding history revealed 12.22% breast feeders while 87.78% were bottle feeders. 68.15% children were taking over diluted milk users, 80% were taking boiled milk while 79.26% were feeding on milk-sugar solution. Mother's education status was as 38.15% good while 61.85%. 57.41% were living in rural areas and 42.59% were from urban areas. 87.04% patients were from areas where poor sanitary systems were present. 19.63% mothers were having good hand washing habits, 1.11% mothers don't

have hand washing habits and 79.62% were washing hands randomly.

Discussion:

Children from rural areas were more vulnerable to diarrhoea than those from the urban areas as found by Vella et al in north-western Uganda. Children whose families used water from unprotected sources were more vulnerable to diarrhoea than their more fortunate counterparts. The children whose homes used water from protected sources had a lower risk of diarrhoea relative to children whose homes used water from unprotected sources (9). Current study also reported similar results.

According to another study, the occurrence of diarrhoea was positively associated with rural residence aged 6 to 23 months open dumping of refuse around the house, lack of hand washing facility and presence of two or more children under 5 years old in the household (10). This study also found more rural patients suffering from diarrhoea.

Conclusion:

In conclusion, the variation in the level of diarrheal morbidity was well explained by maternal education, income, personal hygiene, refuse disposal system and the effect of health extension programme. It is recommended that, the strategy of being model families, and behavioural change communication education emphasized on personal hygiene lead to total sanitation should be strengthening to reduce the risk of childhood diarrhoea.

Conflict of interest: Authors do not have any conflict of interest.

Human and Animal Rights: No rights violated

Informed Consent: A formal informed consent was obtained from participant's parents.

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Supplementary File 1:

Study Questionnaire

Risk factors of diarrhoea in malnourished children under age of 5 years

Serial # _____
Date : _____
Demographical investigation:

Pt Name: _____ Age/Gender : _____

Socioeconomic status: _____ Adress : _____

Head circumference : _____ Weight : _____

Height : _____ vaccination : _____

Feeding history : _____ weaning history: _____

Blood in stool : Yes No

Dehydration : Yes No

Loos watery diarrhoea: Yes No

Abdominal pain : Yes No Fever: Yes No

Abdominal cramps : Yes No Bloating: Yes No

Nausea : Yes No vomiting: Yes No

Lethargy : Yes No

Boiled water usage : Yes No Good Hygiene : Yes No

Bottle feeding : Yes No Bottle washing: Yes No

Breast washing : Yes No Over diluted milk : Yes No

Boiled Milk : Yes No Sugar Addition: Yes No

Good maternal education: Yes No

Good household condition: Yes No

Living Area: Urban Rural Proper sanitation: Yes No

Hand washing : Yes No Sometimes

Use of soap : Yes No Sometimes